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(54) METERING OF TELECOMMUNICATIONS SERVICES

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G06F 15/16 (2006.01)

(52) **U.S. Cl.**
USPC **709/205**; 709/223; 709/224; 709/225; 709/229

(58) **Field of Classification Search**
USPC 709/205, 223, 224, 225, 229
See application file for complete search history.

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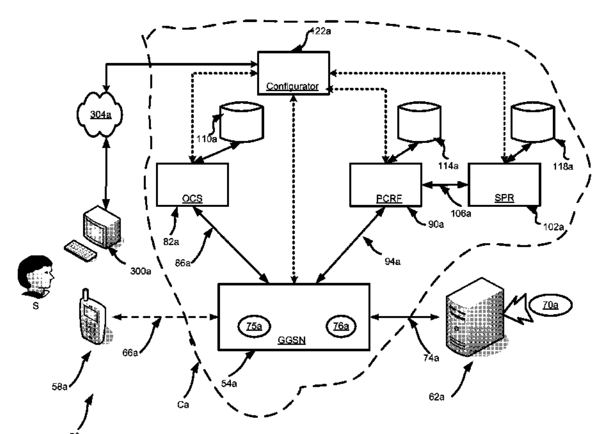
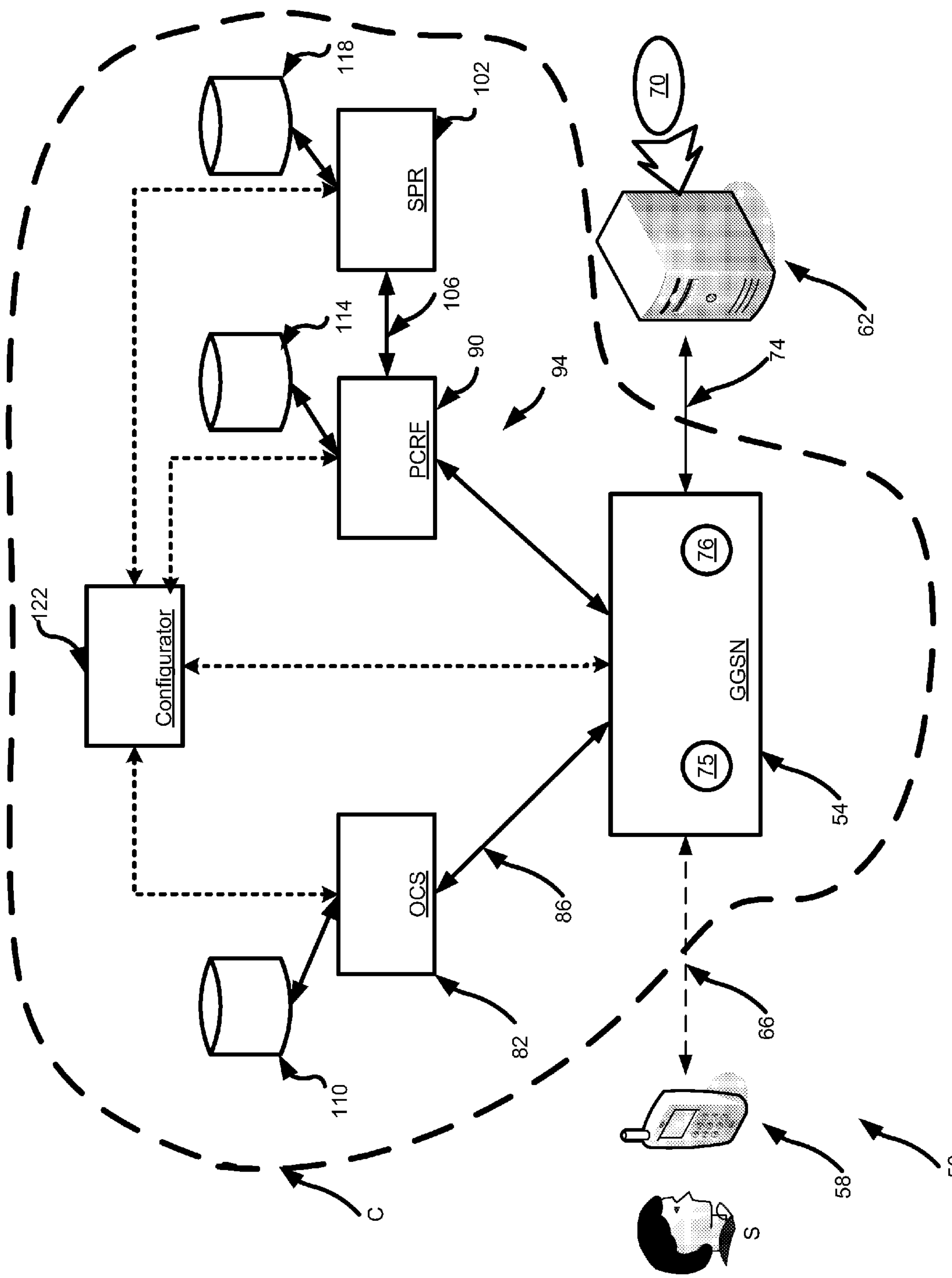
(57) **ABSTRACT**

A configurator is provided that connects with various disparate elements in a telecommunication system. The configurator is adapted to receive a traffic plan that has a plurality of different aspects that are implemented across the disparate elements. The configurator is adapted to generate processing schemas and/or databases that can be used by the disparate elements in order to implement the traffic plan.

28 Claims, 9 Drawing Sheets

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PCRF
Configurator
OCS
GGSN
70
76
75
118
102
114
106
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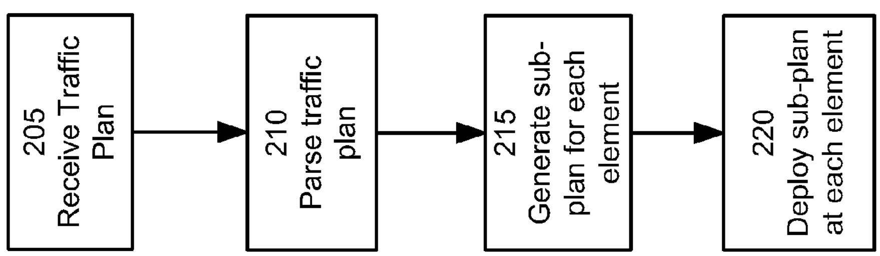
94
74
62
122
54
86
82
66
110
58
50
C
S

Fig. 1

Fig. 2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Plan
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plan for each
element
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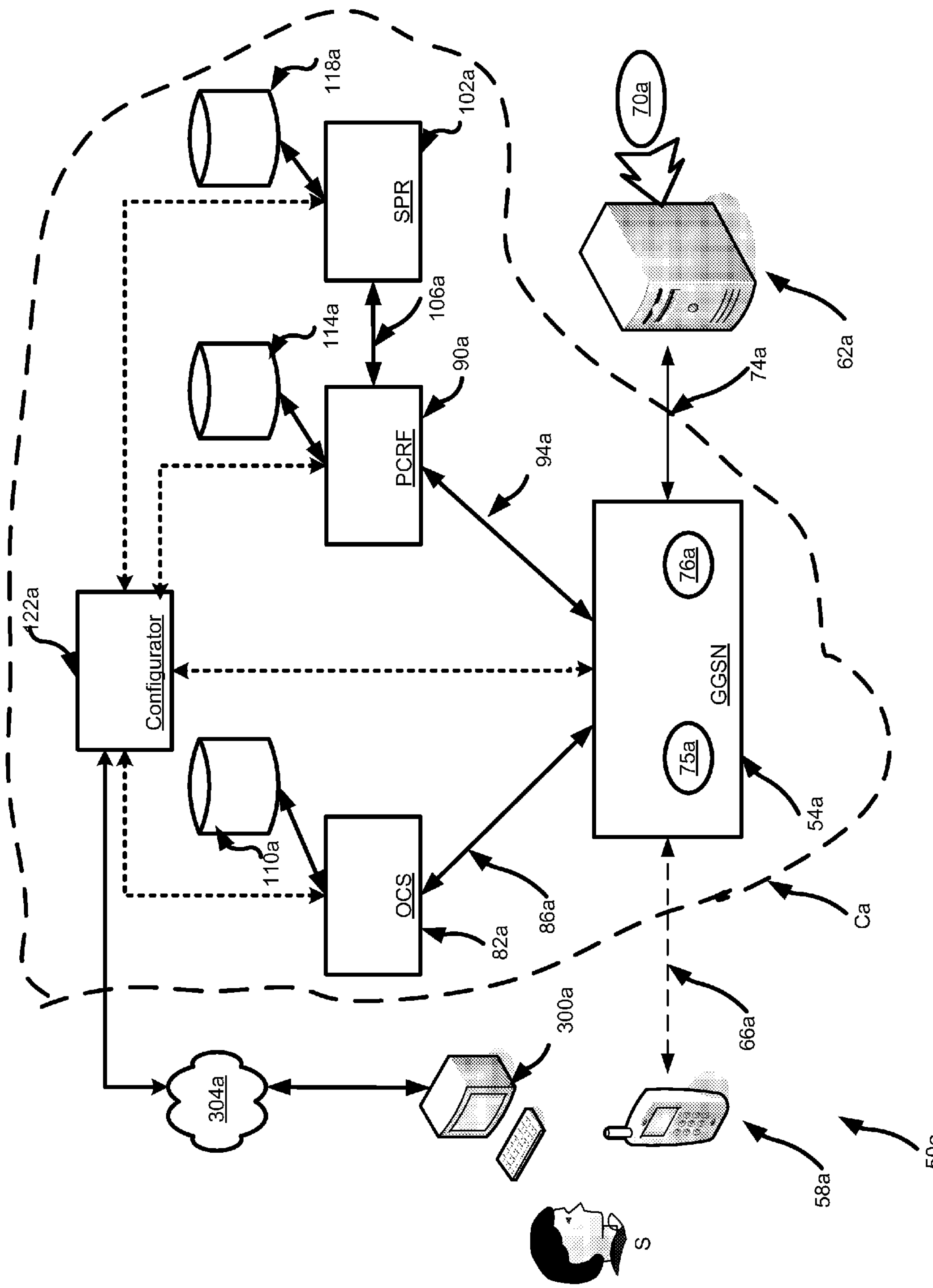
at each element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SPR
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PCRF
94a
70a
62a
74a
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Configurator
GGSN
76a
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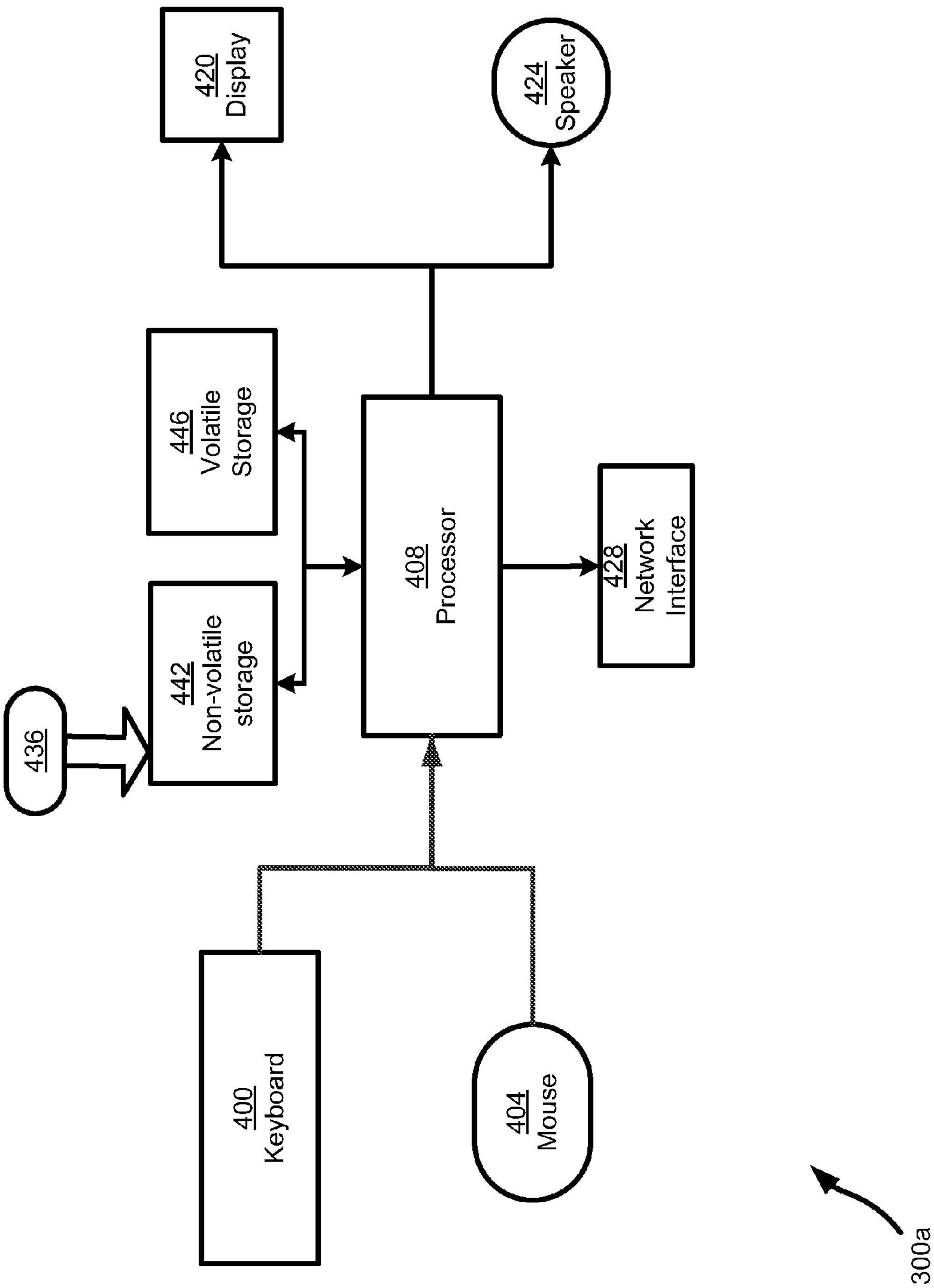
54a
110a
OCS
82a
86a
Ca
300a
304a
66a
58a
50a
S

Fig. 3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Processor
428
Network
Interface
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404
Mouse
300a

Fig. 4

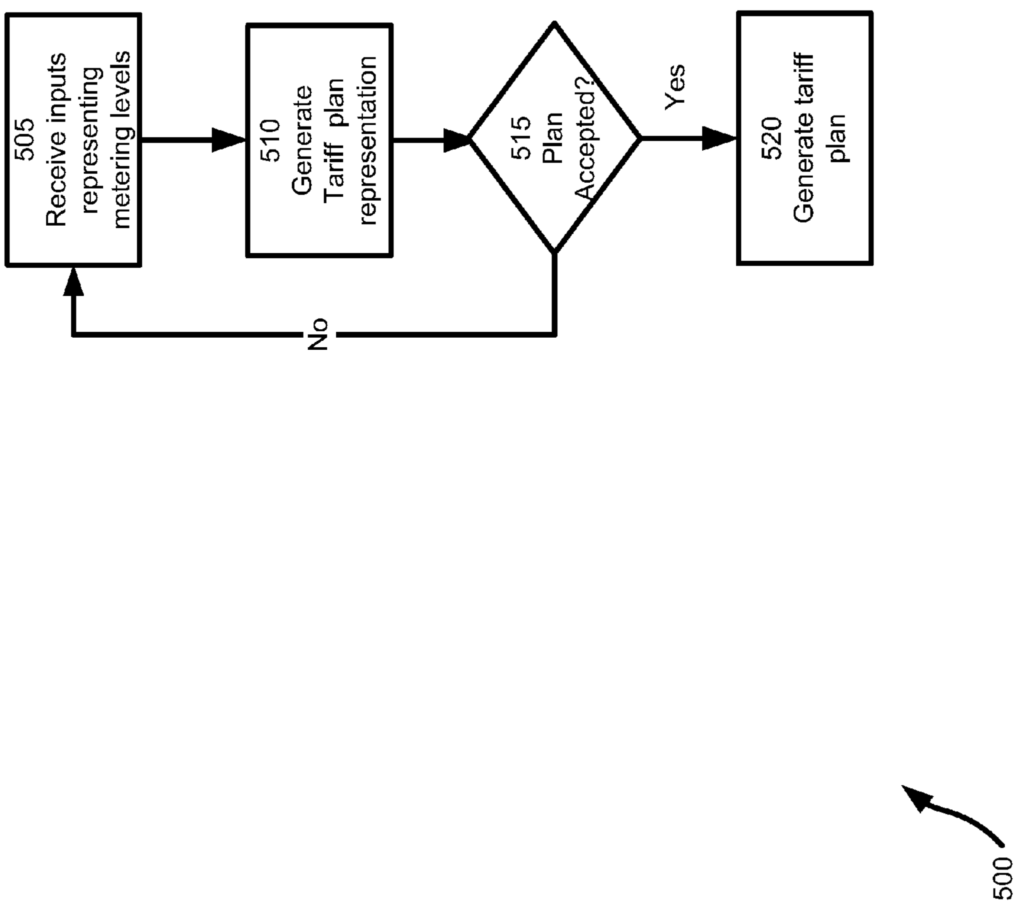
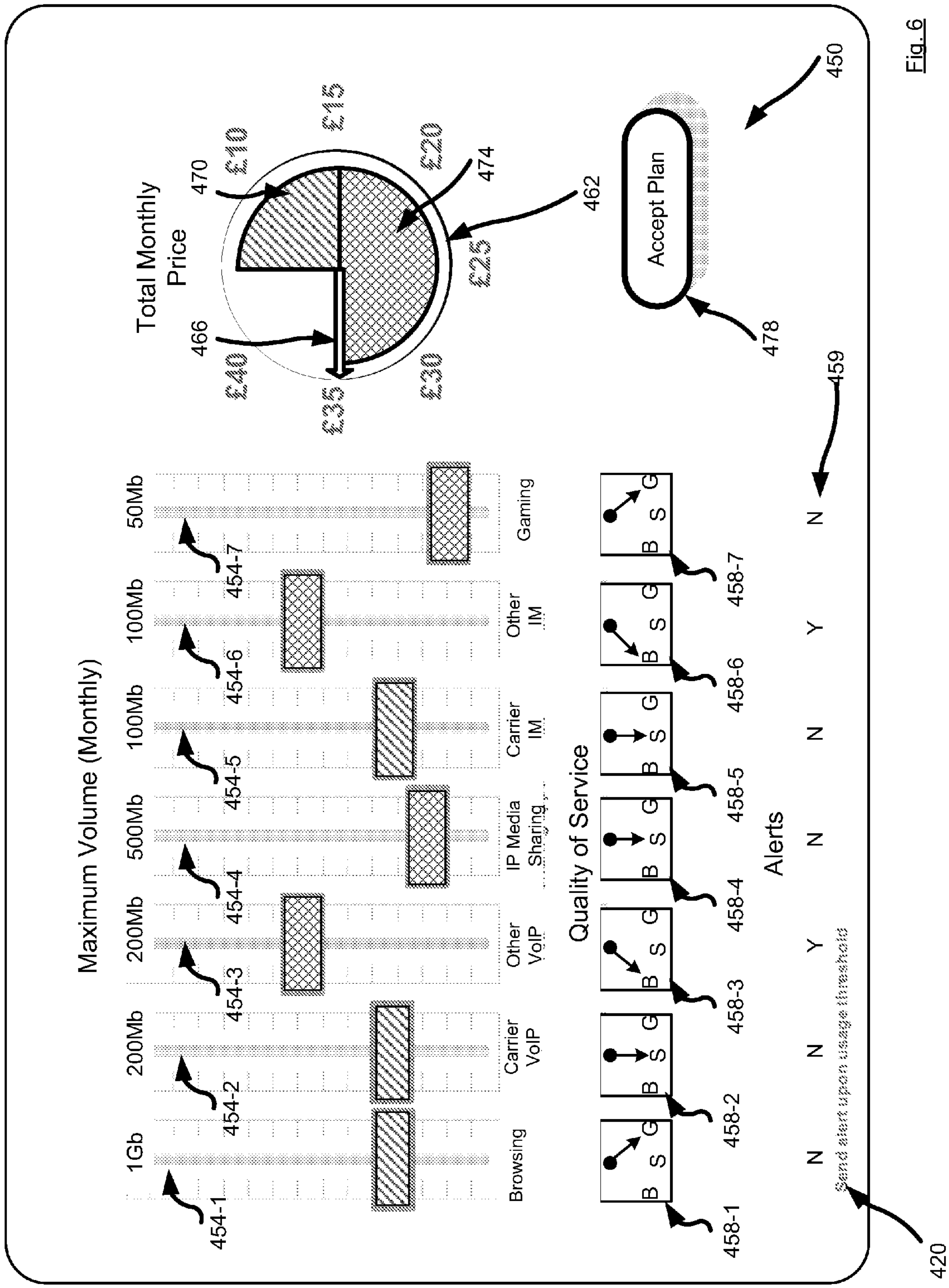

505
Receive inputs
representing
metering levels
510
Generate
Tariff plan
representation
515
Plan
Accepted?
Yes
No
520
Generate tariff
plan
500

Fig. 5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200Mb
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454-4
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454-6
454-7
Browsing
Carrier VoIP
Other VoIP
IP Media Sharing
Carrier IM
Other IM
Gaming
Quality of Service
B S G
458-1
458-2
458-3
458-4
458-5
458-6
458-7
Alerts
N
N
Y
N
N
Y
N
459
Send alert upon usage threshold
420
Total Monthly Price
£10
£15
£20
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£30
£35
£40
470
474
462
466
Accept Plan
478
450

Fig. 6

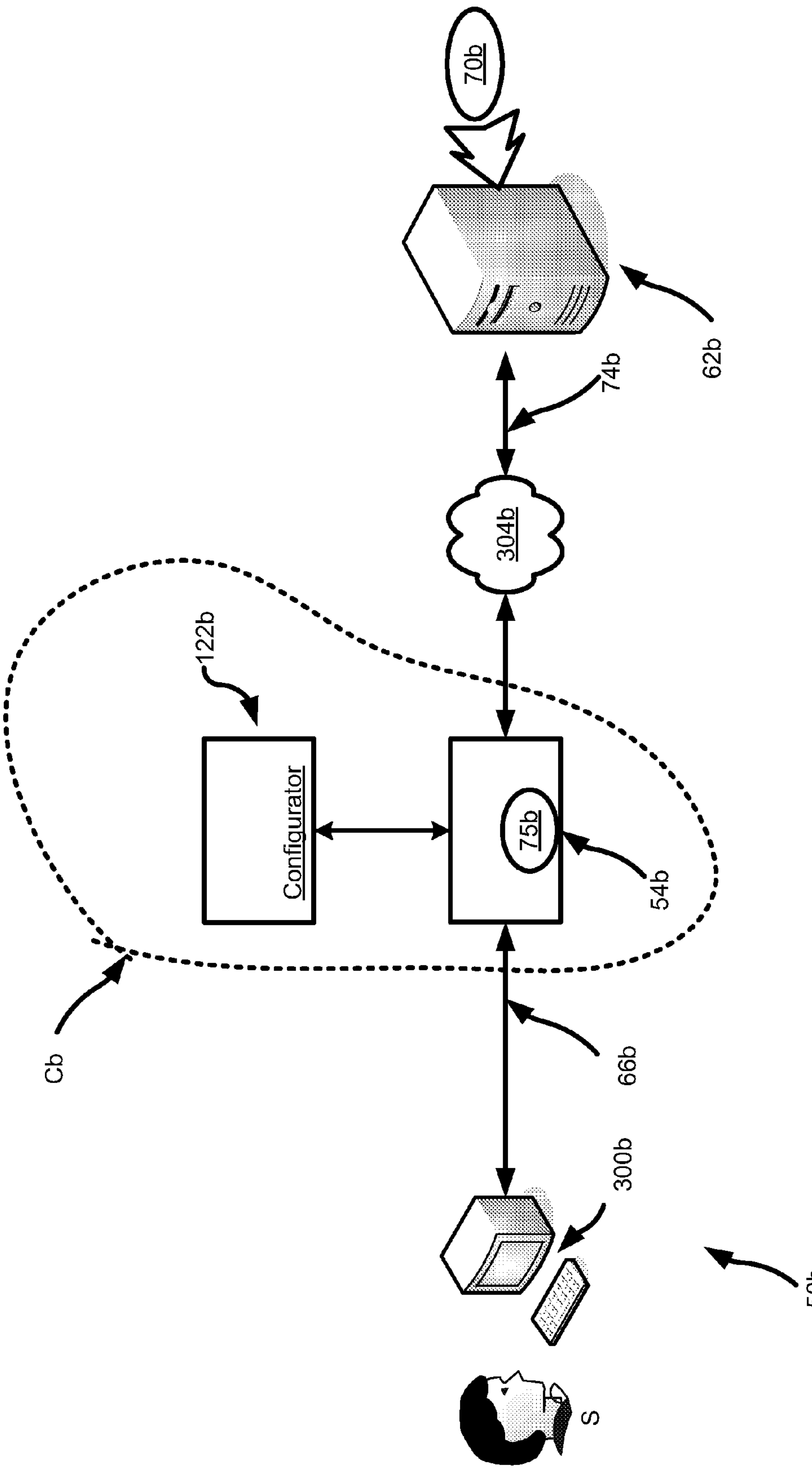
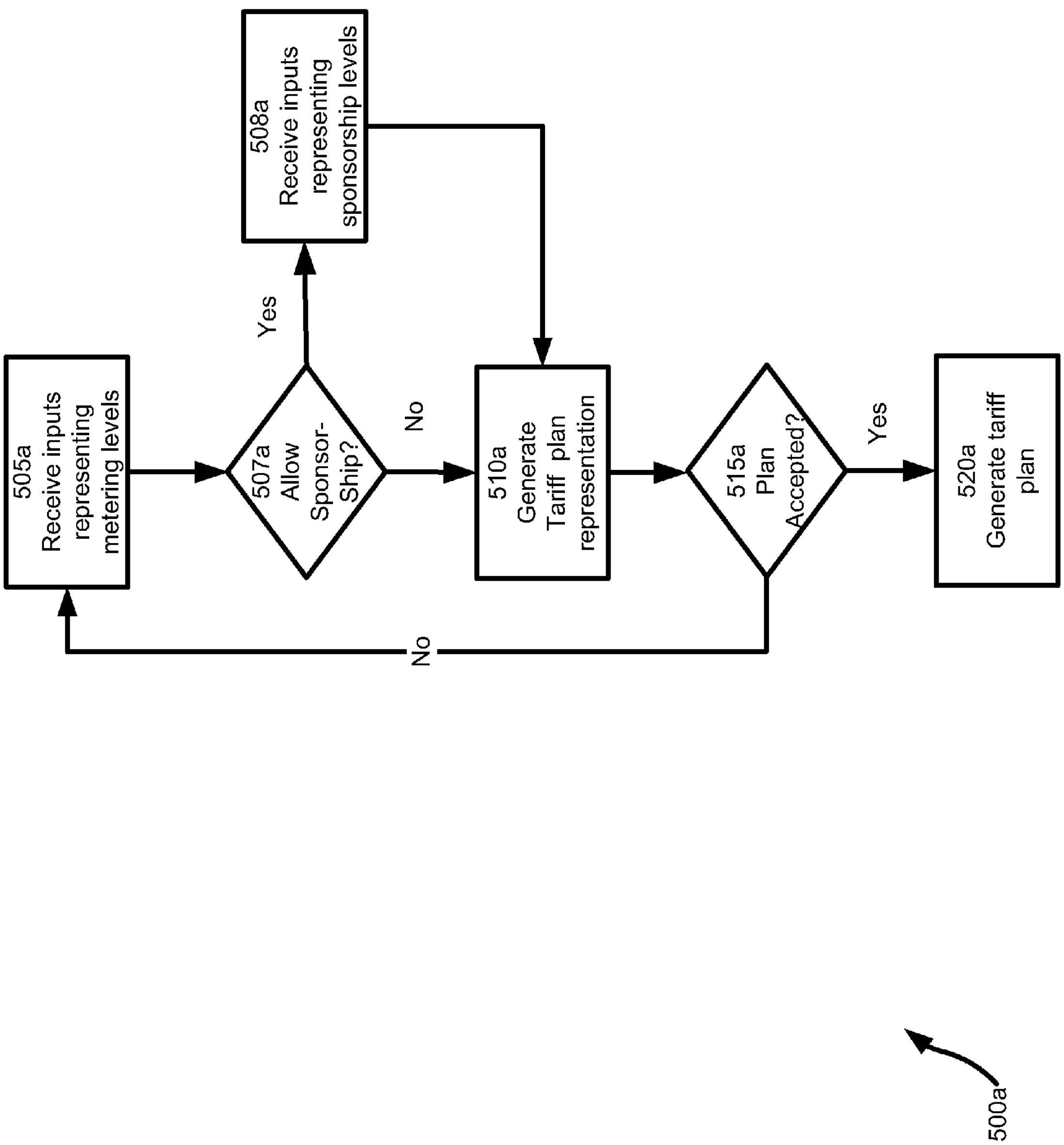


Fig. 7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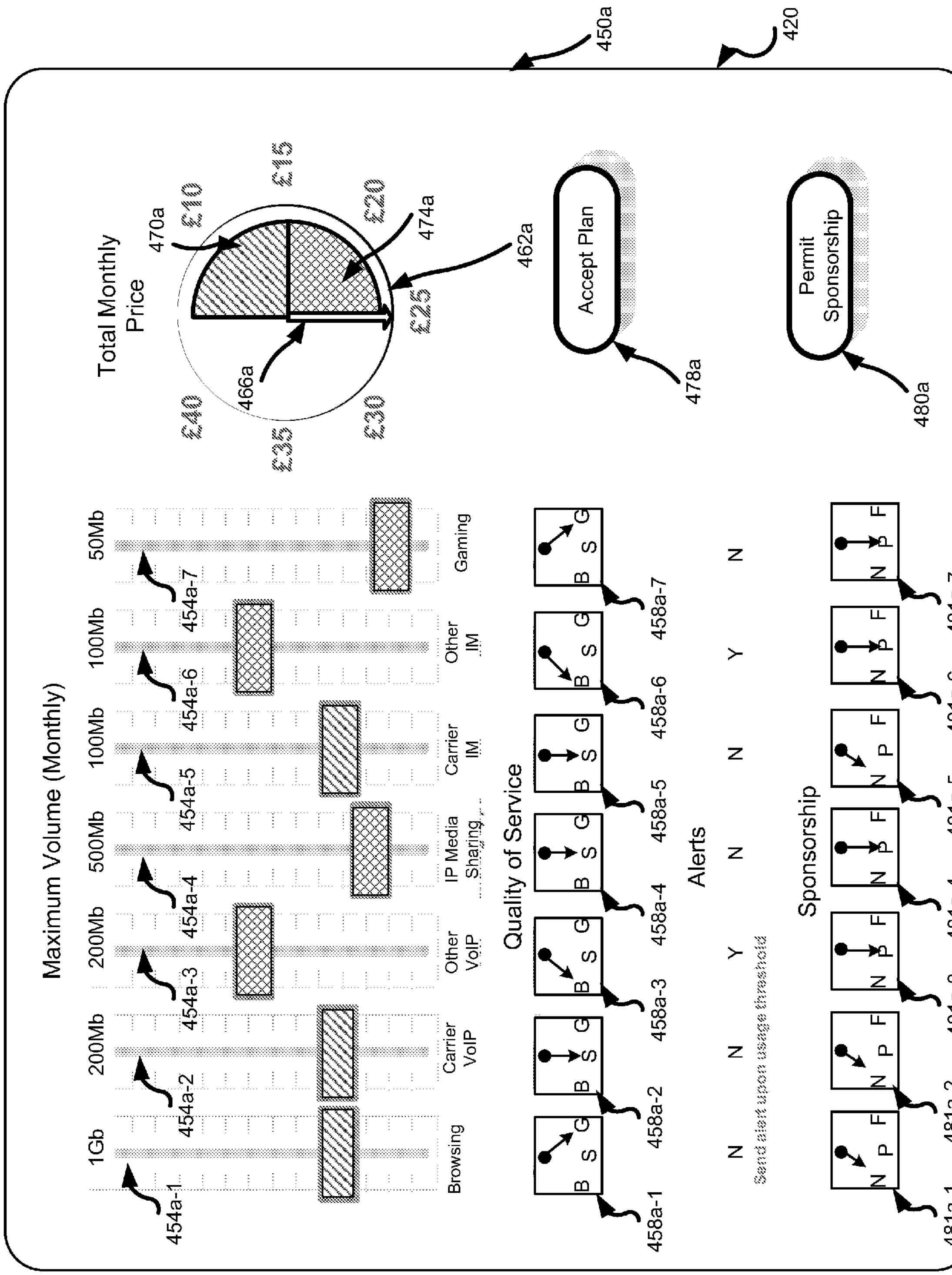
Receive inputs
representing
metering levels
507a
Allow
Sponsor-
Ship?
Yes
508a
Receive inputs
representing
sponsorship levels
No
510a
Generate
Tariff plan
representation
515a
Plan
Accepted?
Yes
520a
Generate tariff
plan
No
500a

Fig. 8



450a
420
Maximum Volume (Monthly)
1Gb
200Mb
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454a-1
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454a-5
454a-6
454a-7
Browsing
Carrier VoIP
Other VoIP
IP Media Sharing
Carrier IM
Other IM
Gaming
Quality of Service
458a-1
458a-2
458a-3
458a-4
458a-5
458a-6
458a-7
Alerts
N N Y N N Y N
Send alert upon usage threshold
Sponsorship
481a-1
481a-2
481a-3
481a-4
481a-5
481a-6
481a-7
Total Monthly Price
£10
£15
£20
£25
£30
£35
£40
470a
474a
462a
466a
Accept Plan
478a
Permit Sponsorship
480a

Fig. 9

METERING OF TELECOMMUNICATIONS SERVICES

FIELD

The present specification relates generally to telecommunications and more particularly relates to metering of telecommunication services.

BACKGROUND

Hardware advances in computing devices and the networks which interconnect those devices has facilitated an explosion in software applications. Applications such as real-time chat, voice and video are increasingly commonplace and widespread. Voice over Internet Protocol ("VOIP") telephony allows real-time duplex voice communications to be carried over traditional data channels, potentially obviating the need for traditional voice channels, without the latency or jitter normally associated with the specifications of such data channels.

While somewhat behind wireline networks, wireless networks are also increasing in bandwidth to allow substantially real-time chat, voice and video applications to be carried thereover. Likewise, the processing power of handheld portable devices such as cellular telephones and wireless personal digital assistants can now accommodate such applications.

Traditional revenue sources for wireline and wireless networks include voice telephony and traditional data communications. However, the above-mentioned advances are confusing the means by which network operators are compensated by consumers. For example, traditional voice channels were configured to be carried over twisted pair copper telephone wires, yet, technology advances now permit high speed Internet communications to be carried over twisted pair. Still further advances now permit voice communications to be carried over those Internet connections. As a result, the subscriber may eschew the underlying voice service in favour of the Internet service which now serves to provide both voice and traditional data connectivity for the subscriber. This erodes the underlying revenue base for the wireline carrier, whose business model may depend on charging separate fees for both voice and traditional data services. Hardware advances now raise the same possibility of erosion of revenue sources for wireless carriers, which originally offered only wireless voice connectivity but are increasing offering both voice and data connectivity. However the subscriber may be able to find applications to carry the voice service over the data link and thereby avoid charges for voice services.

The preceding examples are the tip of the iceberg. Applications such as Skype, Google Maps, You Tube, file sharing services were unforeseen applications that can radically alter the bandwidth profiles for each subscriber, with deleterious effects on bandwidth and quality-of-service allocations which did not anticipate these services. The result can be a serious deterioration of quality of service for some subscribers as other subscribers unfairly monopolize all available bandwidth.

To address the foregoing, it is increasingly becoming known to monitor wireless traffic so that it can be classified and further processed according to classification, such further processing including the possibility of blocking the traffic and/or to apply different rates of charge according to classification. However, current network infrastructures can still be improved. Indeed, one problem is that, even within the current 3GPP or 3GPP2 specifications for different telecommunication elements, it can readily arise that configurations for those elements within one carrier infrastructure are handled in a disparate manner.

SUMMARY

From one perspective, the present specification provides a configurator that connects with various disparate elements in a telecommunication system. The configurator is adapted to receive a traffic plan that has a plurality of different aspects that are implemented across the disparate elements. Exemplary aspects include policy aspects and charging aspects. Such a traffic plan can include tariffs, rating rules, pricing, bandwidth, priorities, allow/block indicators, bundling details and can include other controls that pertain to the behavior of a subscriber's use of an application, content, or service. The configurator is adapted to generate processing schemas and/or databases that can be used by the disparate elements in order to implement the traffic plan.

From another perspective, the present specification provides a method for metering telecommunication services. The method comprises receiving a plurality of variable inputs at a subscriber terminal. Each of inputs represent a different metering level for a different application, content, or service. The method also comprises generating a traffic plan based on each metering level. The generated traffic plan can be provided to the configurator or to a similar type component so that telecommunication services can be delivered according to the traffic plan. The method also comprises generating a representation of the traffic plan at the subscriber terminal.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic representation of a communication system.

FIG. **2** is a flow-chart depicting a method of configuring a communication system.

FIG. **3** is a schematic representation of a communication system which is a variation on the system of FIG. **1**.

FIG. **4** is a schematic representation of the subscriber terminal of FIG. **3**.

FIG. **5** is a flow-chart depicting a method for metering telecommunication services.

FIG. **6** shows the display of the device of FIG. **4** during part of the performance of the method of FIG. **5**.

FIG. **7** is a schematic representation of a communication system which is a variation of the system of FIG. **1**.

FIG. **8** is a flow-chart depicting a method for metering telecommunication services as a variation on the method of FIG. **5**.

FIG. **9** shows the display of the device of FIG. **4** during part of the performance of the method of FIG. **8**.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The following definitions relate to telecommunication structures referenced in this specification:

"3GPP Standards" means the Technical Specifications as have been produced by the 3rd Generation Partnership Project (3GPP) as updated from time to time.

"3GPP2 Standards" means the Technical Specifications as have been produced by the 3rd Generation Partnership Project 2 (3GPP2) as updated from time to time.

"AAA" means Authentication, Authorization and Accounting

"AF" means Application Function as described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"AS" means Application Server

"CDR" means Call Detail Record

"DIAMETER protocol" means the computer networking protocol for AAA that is a successor to RADIUS as generally described by IETF RFC 3588—"Diameter Base Protocol" as updated from time to time

"DPI" means Deep Packet Inspection

"GGSN" means GPRS Gateway Service Node as described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"Gx" means the link and protocol that resides between the PCEF and the PCRF as generally described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"Gy" means the link and protocol that resides between the OCS and the PCEF as generally described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"GPRS" means General Packet Radio Service

"IETF" means Internet Engineering Task Force

"IMS" means IP Multimedia Subsystem as described in 3GPP TS 23.228—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS); Stage 2" as updated from time to time.

"IP" means Internet Protocol

"ISDN" means Integrated Services Digital Network

"MSISDN" means Mobile Subscriber ISDN Number

"OCS" means Online Charging Server as described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"PCC" means Policy and Charging Control as described in 3GPP TS 23.228—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS); Stage 2" as updated from time to time

"PCEF" means Policy Charging Enforcement Function as described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"PCRF" means Policy Charging Rules Function as described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time.

"P-CSCF" means Proxy Call Session Control Function as described in 3GPP TS 23.228—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS); Stage 2" as updated from time to time

"RADIUS" means Remote Authentication Dial In User Service

"RAT type" means Radio Access Technology type

"Rx" means the link and protocol that resides between the AF and the PCRF as generally described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"RFC" means Request for Comments

"SIP" means Session Initiation Protocol

"SCP" means Service Control Point

"SPR" means Subscription Profile Repository as generally described in 3GPP TS 23.203—"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture" as updated from time to time

"SIP" identity means canonical SIP Uniform Resource Identifier employed to reach a user or device (such as 'sip: alice@atlanta.com)'

"SUB ID" means any unique SUB IDentifier. SUB ID can be, for example, a MSISDN or a SIP identity.

Referring now to FIG. **1**, a communication system is indicated generally at **50**. System **50** comprises a GGSN **54** operated by a carrier C. GGSN **54** interconnects a wireless client device **58** operated by a subscriber S and a server **62**. GGSN **54** is based on known GGSN infrastructures, with novel modifications thereto as will be discussed further below. Those skilled in the art will recognize that the GGSN **54** may be manifested as other network elements in the context of other access technologies. For example, a packet serving data node (PDSN) for a code division multiple access (CDMA) based network; the IP edge router for a European Telecommunications Standards Institute (ETSI) based network; the cable Modem termination system (CMTS) for a PacketCable based network; a access service network (ASN) gateway for a WiMax based network; or a deep-packet inspection node for a generic internet protocol based network.

Wireless client device **58** is associated with a subscriber S and can be based on any known or future-conceived mobile or nomadic communication equipment including, for example, a cellular telephone or a wireless personal digital assistant. While not shown herein, it will understood by those skilled in the art that the wireless client device **58** includes a hardware configuration that may comprise one or more input devices in the form of a keyboard, microphone and the like; one or more output devices in the form of a display, a speaker and the like; a radio for conducting wireless communications; all of which are interconnected by a microcomputer comprised of one or more central processing units that itself is connected to volatile memory and non-volatile memory.

Wireless client device **58** connects to GGSN **54** via a first link **66**. First link **66** is based on any combination of wireless and wired infrastructures that are now-known, or future-conceived, that can connect wireless client device **58** with GGSN **54**. For example, first link **66** can conform with a 3GPP infrastructure that includes a wireless base station that communicates wirelessly with the radio in client device **58**, backhaul such as a T1, a mobile switching center, routers and the like.

Server **62** can be based on any known or future-conceived servers, including for example, a web server or any other type of server capable of hosting a service **70** on behalf of client device **58** and for use by subscriber S. Any type of service **70** is contemplated including applications. Examples of services include, but are not limited to, software downloads, webpages, instant messaging, email, web-mail, mapping services, location applications, social networking services and applications, file sharing services and applications, peer-to-peer services, music or video streams or downloads. Thus, it should be understood that server **62** can be any other computing device to which client device **58** may communicate, including another client device, and thus service **70** can also include peer-to-peer type applications including voice over

IP, and file sharing. While not shown herein, it will understood by those skilled in the art the server **62** includes a hardware configuration that may comprise one or more input devices in the form of a keyboard, a mouse and the like; one more output devices in the form of a display, and the like; a network interface for conducting network communications; all of which are interconnected by a microcomputer comprised of one or more central processing units that itself is connected to volatile memory and non-volatile memory.

Server **62** connects to GGSN **54** via a second link **74**. Second link **74** is based on any combination of wireless or wired infrastructures that are now-known, or future-conceived, that can connect server **62** with GGSN **54**. For example, second link **74** can include a 3GPP infrastructure associated with GGSN **54** that includes a gateway to a local area network or wide area network that in turn uses a data protocol such as the IP. Likewise, second link **74** can include relevant portions of the Internet associated with server **62**, which connects to the network interface in server **62**.

GGSN **54** itself can be based on any known or future-conceived servers having a hardware structure that is generally consistent with the hardware structure discussed in relation to server **62** except including the appropriate interfaces to connect to link **66** and link **74** and (other links as discussed below as shown in FIG. **1**), as well as including software that configures the server to fulfill the function of a GGSN as prescribed by the relevant 3GPP standards. GGSN **54** is configured to implement a DPI engine **75**. Those skilled in the art will recognize that the methods of identifying and classifying distinct subscriber and application specific bearer flows are collectively referred to as 'Deep Packet Inspection' capabilities. With respect to parametric information that is inherent in the bearer data flow that can be used to identify and classify subscriber or application specific data flows, this may include the source and destination internet protocol addresses, port information, protocol information, and other information that conveys the access technology used (such as the Radio Access Technology parameter). Information that may be conveyed between the device **58** and the server **62** may include the application identifier, flow identifiers, and the media type(s) associated with a given service or application. In addition to the utilization of explicit addressing or application information inherent in the data flow or conveyed from external network elements or application servers, the DPI engine **75** may recognize patterns or characteristic traffic flows as indicative 'signatures' that are associated with a given service or application. GGSN **54** is also configured to implement a PCEF **76** as will be discussed further below. In a present embodiment, DPI engine **75** and PCEF **76** are implemented as software processes on GGSN **54**, although it is to be understood that they can be implemented on one or more separate pieces of hardware functionally connected to GGSN **54**.

GGSN **54** also connects to an OCS **82** via a third link **86**. OCS **82** itself can be based on any known or future-conceived servers having a hardware structure that is generally consistent with the hardware structure discussed in relation server to **62** except including the appropriate interfaces to connect to link **86**, as well as including software that configures the server to fulfill the function of an OCS as prescribed in the 3GPP standards OCS **82** is configured to fulfill charging functions in relation to the subscriber account associated with subscriber S (such as maintaining records in association with the MSISDN of device **58**) in at least one of a post-paid and a pre-paid context. In the post-paid context OCS **82** is thus configured to generate CDRs that can be used to add charges to the bill or account of a subscriber. In the pre-paid context OCS **82** is thus configured to fulfill the functions of an SCP (and in fact OCS **82** can be implemented as an SCP) that can be used to deduct amounts from a subscriber's prepaid balance. Regardless of the post-paid or pre-paid context, in a present exemplary embodiment OCS **82** is configured to perform such charging in a substantially real-time manner, whereby as the service is being delivered to subscriber S, the charges associated with that service are being applied. Third link **86** can be based on any physical infrastructure that is suitable for connecting GGSN **54** to OCS **82** as will now occur to those of skill in the art. For example, third link **86** can be configured to carrying communications using the Gy protocol. Those skilled in the art will now recognize that the Gy protocol may be manifested as other protocols in the context of other access technologies. For example, where the analogous protocol for a code division multiple access (CDMA) based network is generally described in 3GPP2 X.S0013—"All-IP Core Network Multimedia Domain" as amended from time to time and where the analogous protocol for an internet protocol access technology is generally described in ETSI ES 282 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-system (RACS) Functional Architecture" as amended from time to time.

GGSN **54** also connects to a PCRF **90** via a fourth link **94**. PCRF **90** itself can be based on any known or future-conceived servers having a hardware structure that is generally consistent with the hardware structure discussed in relation server to **62** except including the appropriate interfaces to connect to link **94** as well as including software that configures the server to fulfill the function of a PCRF as prescribed in the 3GPP standards. PCRF **90** is configured to fulfill tariff decision, bandwidth quality decision and traffic gating decision (collectively the traffic plan decision) functions which in turn can be used by PCEF **76** within GGSN **54** and eventually by OCS **82** in order to determine the actual charge. PCRF **90** is thus configured to decide traffic policies between device **58** and server **62**, including, but not limited to, traffic associated with the access of service **70** on device **58**. Indeed PCRF **90** is configured to decide traffic policies on all traffic types carried by GGSN **54**. PCRF **90** is also configured to perform such traffic plan decision in substantially real time in order to coordinate with the real time functionality of OCS **82**.

Fourth link **94** can be based on any physical infrastructure that is suitable for connecting GGSN **54** to PCRF **90**. In a present embodiment fourth link **94** is configured to communications using the Gx protocol. In a more general embodiment, fourth link **94** is configured to carry communications relative to the final determination of an actual traffic plan decision for a given traffic that is being carried between device **58** and server **62**.

Those skilled in the art will now recognize that the various protocols discussed herein may be manifested as other protocols in the context of other access technologies. For example, where the analogous protocols for a code division multiple access (CDMA) based network are generally described in 3GPP2 X.S0013—"All-IP Core Network Multimedia Domain" as amended from time to time and where the analogous protocols for an internet protocol access technology are generally described in ETSI ES 282 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-system (RACS) Functional Architecture" as amended from time to time.

PCRF **90** also connects to SPR **102** via fifth link **106**. SPR **102** can be implemented as a file server which includes a microcomputer, a network interface and persistent storage in order to maintain data and in order to allow that data to be accessed by PCRF **90** and any other network element that connects to SPR **102**. The data that SPR **102** is configured to maintain includes profile information about subscriber S. Such profile information can include, but need not be limited to, an identification of subscriber S (including for example the MSISDN of device **58**), whether subscriber S is a prepaid or postpaid subscriber, the various types of traffic that subscriber S is permitted to received on device **58**, the various rates for any traffic that subscriber S accesses on device **58**, including rates for traffic associated with the accessing of service **70** on device **58**, subscriber preferences such as a preferred quality of service to be associated with accessing a given service **70** via device **58**, and subscriber or network operator imposed limitations such as an upper bound on the total bandwidth consumed by subscriber S via device **58**.

Fifth link **106** can be based on any desired physical link and protocol in order to communicate subscriber profile data to PCRF **90**. It should now be apparent that SPR **102** can be implemented within PCRF **90**, or it can be situated remotely from PCRF **90** so that a plurality of different PCRFs (not shown) and other network elements can centrally access profile data relative to subscriber **102**.

System **50** also comprises a plurality of storage devices **110**, **114** and **118**. As can be seen in FIG. **1**, storage device **110** is connected to OCS **82** and is therefore configured to maintain data usable by OCS **82** to permit OCS **82** to fulfill its functions. Likewise, storage device **114** is connected to PCRF **90** and is therefore configured to maintain data usable by PCRF **90** to permit PCRF **90** to fulfill its functions. Likewise, storage device **118** is connected to SPR **102** and is therefore configured to maintain data usable by SPR **102** to permit SPR **102** to fulfill its functions. It should now be apparent that each storage device **110**, **114** and **118** can be implemented, if desired, as a component within its respective component.

It can also be noted at this point that storage devices **110**, **114** and **118** each maintain using different data structures, and that some of those data structures can be common amongst all storage devices **110**, **114** and **118**, while some of those data structures can be disparate amongst all storage devices **110**, **114** and **118**. The common data structures can arise because aspects of those storage devices are constrained by the requirements 3GPP Standards. The fact The different data structures can arise because aspects of those storage devices will be constrained by unique specifications of the carrier C that defines the domain in which GGSN **54**, PCRF **90**, OCS **82** and SPR **102** are operated. Alternatively, or additionally, the fact that different specifications for data structures have arisen can result from the fact that GGSN **54**, PCRF **90**, OCS **82** and SPR **102** may themselves be designed according to different specifications (e.g. one or more of GGSN **54**, PCRF **90**, OCS **82** and SPR **102** may be provided by different originating equipment manufacturers each with their own unique "flavor" or variation.) Alternatively, or additionally, the fact that different specifications for data structures have arisen can result from the fact that GGSN **54**, PCRF **90**, OCS **82** and SPR **102** may have been deployed at different times and according to different programs and therefore the data structures associated therewith have been specified differently.

Notwithstanding the specific examples above, it should now be understood that in general each storage device **110**, **114**, and **118** needs to maintain data that is consistent with the other storage devices **110**, **114** and **118**; but each storage device **110**, **114** and **118** can also have extra data that is not found at the other storage devices **110**, **114** and **118**. Therefore, all storage device **110**, **114**, and **118** have to be synchronized according to the specific configuration detail they each need to hold. (Those skilled in the art will now recognize that in FIG. **1** GGSN **54**, PCRF **90**, OCS **82**, SPR **102** and the associated storage devices **110**, **114** and **118** are enclosed within the dashed enclosed area indicated at reference C, which represents the carrier C that operates those components. It should also now be understood however that carrier C is a simplified example and that those skilled in the art will recognize how a variation of system **50** can accommodate the components within carrier C being operated by multiple carriers to accommodate roaming scenarios).

System **50** also comprises a configurator **122** that connects to each of GGSN **54**, PCRF **90**, OCS **82** and SPR **102**. As will be discussed further below, configurator **122** is configured to receive a traffic plan for subscribers and to automatically deploy that plan amongst GGSN **54**, PCRF **90**, OCS **82** and SPR **102** such that GGSN **54**, PCRF **90**, OCS **82** and SPR **102** will be configured to implement said traffic plan.

Configurator **122** can be implemented using known computing environments having appropriate network interfaces to connected with GGSN **54**, PCRF **90**, OCS **82** and SPR **102**. Such a computing environment could be based on a commercial server that includes a microprocessor and volatile storage. The volatile storage can be implemented as random access memory ("RAM") and can be used to temporarily store applications and data as they are being used by processor. Configurator **122** also includes read only memory ("ROM") connected to the microprocessor which contains a basic operating system containing rudimentary programming instructions, commonly known as a Basic Input/Output System ("BIOS") that are executable by the microprocessor when configurator **122** is initially powered so that a higher level operating system and applications can be loaded and executed on processor. Collectively, one can view the processor, volatile storage device and ROM as a microcomputer. It should now be apparent that configurator **122** can be based on the structure and functionality of a commercial server such as a Sun Fire X4450 Server from Sun Microsystems Inc., of Palo Alto, USA, but it is to be stressed that this is a purely exemplary server, as configurator **122** could also be based on any type of computing device including from other manufacturers.

Referring now to FIG. **2**, a communication method represented in the form of a flow-chart is indicated generally at **200**. Method **200** can be implemented using system **50** or functionally equivalent modified versions of system **50**. To help provide further understanding relative to method **200** and system **50**, method **200** will be discussed in relation to exemplary performance of method **200** using system **50**.

At block **205**, a traffic plan is received. Block **205** is performed at configurator **122** which can receives a data file representing a traffic plan. The mean by which the plan is received is not particularly limited, and can occur, for example, via a user operating a computer terminal that is connected to configurator **122**, whereby the user enters in data via a graphical user interface that represents the traffic plan.

In the present exemplary embodiment the traffic plan is unique to a set of subscribers, including subscriber S, that are associated with traffic plans being offered by carrier C. It should be understood that traffic policies for any number of subscribers S associated with carrier C are contemplated.

The traffic plan includes a plurality of aspects. In a present embodiment, the traffic plan is based on the 3GPP standards and therefore includes charging aspects and policy aspects, where the charging aspects are aspects respective to OCS **82**, and the policy aspects are aspects respective to PCRF **90** and SPR **102**, and both charging aspects and policy aspects respective to GGSN **54**. Table I shows a simplified example of a traffic plan, which includes entries that are unique to subscriber S.

TABLE I

Exemplary contents of Traffic plan								
Entry	Field 1 SUB ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period	Field 6 Billing Arrangement	Field 7 Basic Rate	Field 8 Roaming Rate
1	S	VT1 - VOIP tel 1	115 kbps	100 MB	Day	Postpaid	$10.00/MB	$30.00/MB
2	S	TC1 - Text chat 1	1 kbps	Unlimited	Unlimited	Postpaid	$2.00/MB	$3.00 MB
3	S	MS1 - Music stream 1	25 kbps	50 songs	Day	Postpaid	$1.00/song	$2.00/song

Explaining the structure of Table I in greater detail, Field 1 entitled "SUB ID", is an identifier that can be used uniquely identify a subscriber (e.g. subscriber S). The identifier can either be specific to a device (such as device **58**), or to each specific subscriber (such as subscriber S) contemplating that each subscriber could authenticate with different computing devices and still be subject to the same traffic plan. (While not discussed herein, where subscribers are permitted to authenticate with different computing devices, then policy P could be further enriched, beyond what is shown in Table I, to vary the policy according to the computing device, or even the nature of links connecting the device to network **58**). Field 2 of Table I, entitled "Service" identifies the various types of services that are subject to the traffic plan. As will be explained in greater detail below, services can include any type of service that is currently known or as yet unknown, including voice telephony, chat, video streaming, music streaming and so on. Field 3 of Table I, entitled "Bit Rate" is the maximum permitted bit rate associated with a particular service. Field 4 of Table I, entitled "Volume" is the maximum amount of data that can be downloaded to device **70** and uploaded from device **70**. Field 5, of Table I, entitled "Usage Period" defines the period during which the volume defined in Field 4 is measured. That is to say where usage period indicates "Day" and Volume indicates "1 MB", then the subscriber will be permitted one Megabyte of data transfer during one day. Field 6, of Table I, entitled "Excess Permitted" defines whether the subscriber is permitted to exceed the limits defined in Fields 4 and 5. Such excess may be permitted should the subscriber S agree to be subject to increased billing rates, and/or the sacrifice of limits for other services, and/or some other consideration in exchange for being permitted to exceed the limits defined in Fields 4 or 5. Those skilled in the art will recognize that Fields 3, 4, and 5 can be each divided into two separate fields, one for up-stream traffic from device **70** to network **58** and the other for downstream traffic from network **58**. Field 6 of Table I, entitled "Billing Arrangement" indicates whether a particular service is on a post paid or prepaid basis. Field 7 entitled "Basic Rate" indicates the rate that is charged for a particular service if that particular subscriber accesses that service from within carrier C's coverage area, and according to the corresponding data in Fields 3, 4 and 5. Field 8 entitled "Roaming Rate" indicates the rate that is charged for a particular service if that subscriber S does not that service from within carrier C's coverage area, but instead within the coverage are of another carrier.

Explaining each exemplary service in greater detail, "VT1—VOIP tel 1" in Field 2, Entry 1 identifies a VOIP telephony service that is offered by a first service provider. For example "VT1—VOIP tel 1" could be the well known VOIP application Skype, available at http://www.skype.com. "TC1—Text chat 1" in Field 2, Entry 2 identifies a "chat" service that is offered by a first service provider. For example "TC1—Text chat 1" could be the well known chat application, Google Talk, available at http://google.com. "MS1—Music stream 1" in Field 2, Entry 3 identifies a streaming audio application that is offered by a first service provider. For example "MS1—Music stream 1" could be based on the well known web-site Pandora, available at http://www.pandora.com. Each of these services will be ascertainable by DPI engine **75** as part of its regular function.

It should now be understood that any type of service can be included in Table I, such as peer-to-peer, video services, mapping services. Also a catchall "unknown" service can also be provided where a particular service is being carried that is not ascertainable by DPI engine **75**.

It should now be reemphasized that Table I is a non-limiting example, and one of the features of the specification is the inherent flexibility provided by system **50**. Carrier C is able to define any traffic plan that is desired and provide that traffic plan to configurator **122**.

At block **210** the traffic plan from block **205** is parsed. As part of this block, configurator **122** will analyze the field structures within Table I and determine which fields are relevant to GGSN **54**, PCRF **90**, OCS **82** and SPR **102**. At a general level, at block **210** configurator will parse the traffic plan according to which portion of the traffic plan is relevant to the policy aspects of the traffic plan, and which port of the traffic plan is relevant to the charging aspects of the traffic plan. Table II shows which fields are applicable to the policy aspects or charging aspects or both.

TABLE II

Fields in Traffic plan Applicable to Different Aspects								
	Field 1 SUB ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period	Field 6 Billing Arrangement	Field 7 Basic Rate	Field 8 Roaming Rate
Applicable To:	Both policy and	Both policy and	Policy aspect	Both policy and	Policy aspect	Charging Aspect	Charging Aspect	Charging Aspect

TABLE II-continued

Fields in Traffic plan Applicable to Different Aspects								
	Field 1 SUB ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period	Field 6 Billing Arrangement	Field 7 Basic Rate	Field 8 Roaming Rate
	charging aspects	charging aspects		charging aspects				

Moving beyond this general analysis, configurator **122** also maps each field to the appropriate element (e.g. GGSN **54**, PCRF **90**, OCS **82** and SPR **102**). Thus, continuing with the present example Table III.

TABLE III

Fields in Traffic plan Applicable to Different Elements								
Element	Field 1 SUB ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period	Field 6 Billing Arrangement	Field 7 Basic Rate	Field 8 Roaming Rate
GGSN 54	Y	Y	Y	Y	Y	N	N	N
PCRF 90	Y	Y	Y	Y	Y	N	N	N
SPR 102	Y	Y	Y	Y	Y	N	N	N
OCS 82	Y	Y	N	Y	N	Y	Y	Y

Explaining Table III in greater detail, various flags are provided which indicate whether a particular field in Table I are applicable to each of GGSN **54**, PCRF **90**, OCS **82** and SPR **102**. Where a particular field is relevant, then that field will be used as part of creating a sub-plan for that component. For example, Field 1, SUB ID is indicated as being relevant for each of GGSN **54**, PCRF **90**, OCS **82** and SPR **102** as part of deploying the traffic plan in Table I across GGSN **54**, PCRF **90**, OCS **82** and SPR **102**. However, Field 7 Billing Arrangement is only applicable to OCS **82**.

At block **215**, a sub-plan for each element is generated. Block **215** is also performed by configurator **122**, which generates a sub-plan for each element.

Beginning with the first element in Table III (GGSN **54**) configurator **122** can provide a processing schema for use by GGSN **54** in the application of the traffic plan from Table I. Table IV shows an example of a processing schema that can be generated for GGSN **54** as part of block **215**

TABLE IV

Processing schema for use by GGSN 54				
SUB ID (Field 1 from Table I)	Service (Field 2 from Table I)	Bit Rate (Field 3 from Table I)	Volume (Field 4 from Table I)	Usage Period (Field 5 from Table I)
1. Obtain SUB ID from device 58 as part of monitoring access to service 70. 2. Obtain Service type of service 70 using DPI Engine 75. 3. Forward SUB ID and service type to PCRF 90 to obtain bit rate, volume and usage period policy information		1. Obtain bit rate cap as part of policy information from PCRF 90 respective to SUB ID and Service.	1. Obtain volume cap as part of policy from PCRF 90 respective to SUB ID and Service.	1. Obtain usage period restrictions as part of policy from PCRF 90 respective to SUB ID and service.
1. Forward SUB ID and service type to OCS 82 to obtain permission 2. If permission granted by OCS 82, permit service 70 applying bit rate, volume and usage period restrictions. 3. Record usage of service 70 by SUB ID in view of bit rate, volume and usage periods. 4. Forward results or recorded usage to OCS 82.				

Thus, the processing schema in Table IV can be deployed at block **220** to GGSN **54** in order to configure GGSN **54** to operate in accordance with the traffic plan in Table I, such that accessing of service **70** by subscriber S is permitted in accordance with the traffic plan of Table I.

Returning again to block **215**, turning now to the second element in Table III (PCRF **90**) configurator **122** can provide a processing schema for use by PCRF **90** in the application of the traffic plan from Table I. Table V shows an example of a processing schema that can be generated for PCRF **90** as part of block **215**.

TABLE V

Processing schema for use by PCRF 90				
SUB ID (Field 1 from Table I)	Service (Field 2 from Table I)	Bit Rate (Field 3 from Table I)	Volume (Field 4 from Table I)	Usage Period (Field 5 from Table I)
1. Obtain SUB ID from GGSN 54. 2. Obtain Service type from GGSN 54. 3. Access policy information relative to same from SPR 102		1. Obtain bit rate cap as part of policy information from SPR 102 respective to SUB ID and Service.	1. Obtain volume cap as part of policy from SPR 102 respective to SUB ID and Service.	1. Obtain usage period restrictions as part of policy from SPR 102 respective to SUB ID and service.
1. Forward bit rate cap, volume cap and usage period restrictions to GGSN 54.				

Thus, the processing schema in Table V can be deployed at block **220** to PCRF **90** in order to configure PCRF **90** to operate in accordance with the traffic plan in Table I, such that accessing of service **70** by subscriber S is permitted in accordance with the traffic plan of Table I.

Returning again to block **215**, turning now to the third element in Table III (SPR **102**) configurator **122** can provide a policy and processing schema for use by SPR **102** in the application of the traffic plan from Table I. Table VI shows an example of a policy that can be generated as part of block **215**.

TABLE VI

Contents of Policy to be stored at SPR 102					
Entry	Field 1 Subscriber ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period
1	S	VT1 - VOIP tel 1	115 kbps	100 MB	Day

TABLE VI-continued

Contents of Policy to be stored at SPR 102					
Entry	Field 1 Subscriber ID	Field 2 Service	Field 3 Bit Rate	Field 4 Volume	Field 5 Usage Period
2	S	TC1 - Text chat 1	1 kbps	Unlimited	Unlimited
3	S	MS1 - Music stream 1	25 kbps	50 songs	Day

Thus, the database in Table VI can be deployed at block **220** to SPR **102** in order to maintain a policy that reflects the policy aspects of Table I. Table VII shows an example of a processing schema that can be generated for SPR **102** as part of block **215**.

TABLE VII

Processing schema for use by SPR 102				
SUB ID (Field 1 from Table I)	Service (Field 2 from Table I)	Bit Rate (Field 3 from Table I)	Volume (Field 4 from Table I)	Usage Period (Field 5 from Table I)
1. Obtain SUB ID from PCRF 90. 2. Obtain Service type from PCRF 90. 3. Access policy information relative to same from Table VI.		1. Obtain bit rate cap for subscriber and particular service from Table VI.	1. Obtain volume cap for subscriber and particular service from Table VI.	1. Obtain usage period restrictions for subscriber and particular service from Table VI.
1. Forward bit rate cap, volume cap and usage period restrictions to PCRF 90				

Thus, the processing schema in Table VII can be deployed at block **220** to SPR **102** in order that SPR **102** processes requests from PCRF **90** in a manner that reflects the policy aspects of Table I.

Returning again to block **215**, turning now to the fourth element in Table III (OCS **82**) configurator **122** can provide a charging database and a processing schema for use by OCS **82** in the application of the traffic plan from Table I. Table VIII shows an example of a charging database that can be generated for PCRF **90** as part of block **215**.

TABLE VIII

Contents of Charging Database to be stored at OCS 82					
Entry	SUB ID (Field 1 from Table I)	Service (Field 2 from Table I)	Billing arrangement (Field 6 from Table I)	Basic Rate (Field 7 from Table I)	Roaming Rate (Field 8 of Table I)
1	S	VT1 - VOIP tel 1	Postpaid	$10.00/MB	$30.00/MB
2	S	TC1 - Text chat 1	Postpaid	$2.00/MB	$3.00 MB
3	S	MS1 - Music stream 1	Postpaid	$1.00/song	$2.00/song

Thus, the database in Table VIII can be deployed at block **220** to OCS **90** in order to maintain a charging database that reflects the charging aspects of Table I. Table IX shows an example of a processing schema that can be generated for OCS **82** as part of block **215**.

TABLE IX

Processing schema for use by OCS 82				
SUB ID (Field 1 from Table I)	Service (Field 2 from Table I)	Billing arrangement (Field 6 from Table I)	Basic Rate (Field 7 from Table I)	Roaming Rate (Field 8 of Table I)
1. Obtain SUB ID from GGSN 54. 2. Obtain Service type from GGSN 54. 3. Permit or deny permission to use service based on charging records associated with SUB ID		1. Generate billing records according to billing arrangement. For pre-paid arrangements, deduct from pre-paid account. For post-paid arrangement, add total charge to subscriber bill.	1. Determine if subscriber is using basic rate, and, if so, apply charges based on basic rate.	1. Determine if subscriber is roaming, and, if so, apply charges based on roaming rate.

Thus, the processing schema in Table IX can be deployed at block **220** to OCS **82** in order to configure OCS **82** to operate in accordance with the traffic plan in Table I, such that accessing of service **70** by subscriber S is permitted in accordance with the traffic plan of Table I.

When system **50** is configured according to method **200** using Table I, the usage of service **70** by subscriber S will be performed in accordance with the traffic plan of Table I. In operation, assume that service **70** is VT1—VOIP Tel 1. When subscriber S attempts to access service **70**, DPI engine **75** within GGSN **54** will inspect the packets forming the request to access service **70**, and will ascertain that subscriber S using device **58** is attempting to access service **70**. In turn, GGSN **54** will utilize the processing schema of Table IV to access PCRF **90** to obtain policy information relative to the terms of use of service **70** by subscriber S.

In turn, PCRF **90** will utilize the processing schema of Table V in order to ascertain the relevant policy information. In using the processing schema of Table V, PCRF **90** will access SPR **102**. SPR **102** will in turn use the processing schema of Table VII and access the policy in Table VI to obtain the relevant policy information for VT1—VOIP tel 1, in order to ascertain a bit-rate cap of 115 kbps with a maximum volume of 100 megabytes per day. SPR **102** will return this policy information to PCRF **90** which will forward that policy information back to GGSN **54**. GGSN **54**, still utilizing the processing schema in Table IV, will now access OCS **82** which will use its own processing schema from Table IX coupled with the charging database in Table VIII to perform the charging aspect function of the traffic plan of Table I. If OCS **82** instructs that it permits access, GGSN **54** will (continuing to apply the processing schema of Table IV) permit subscriber S to access service **70**, sending appropriate charging information back to OCS **82**.

Those skilled in the art will now recognize that the traffic plan in Table I has now been implemented using the foregoing teachings, such that accessing of service **70** by subscriber S is permitted in accordance with the traffic plan of Table I. Advantageously, configurator **122** has provided a central location for receiving the traffic plan and automatically configured the various elements of system **50** to implement the traffic plan. This permits carrier C to modify the traffic plan at any time without having to individually update GGSN **54**, PCRF **90**, SPR **102** and OCS **82** to respond to such modifications.

Those skilled in the art will also recognize that the Configurator can also apply the traffic plan to other network elements including, but limited to, the Mobile Switching Center Service Capability Interaction Manager (SCIM), and the Call Session Control Function (CSCF) as well as value added service platforms such as the Multimedia Messaging Service Center (MMS-C), Application Server, Wireless Application Protocol (WAP) Gateway, Short Message Service Center (SMS-C), Unified Messaging Server, and content (e.g. music or video) distribution servers.

The nature and scope of such service profile criteria information is not particularly limited. For example, traffic plan criteria can include a flag indicating that access of service **70** is not permitted whatsoever by device **58** such that device **58** will be prevented access to service **70**. Where access to service **70** is permitted according to the traffic plan criteria, then the traffic plan criteria can include rating information, which can include complex criteria, such as, at least one of: times of day, week or month that access to service **70** is restricted or prevented; tiered rates of charge for accessing service **70** depending on the time of day service **70** is being accessed; maximum bandwidth allocations associated with access to service **70**; maximum amounts of data that can be accessed from service **70**; tiers of rates associated with higher bandwidths or capacities; tiers of rates associated with whether device **58** is roaming or within its home network; privacy management that anonymizes certain data carried between device **58** and service **70**; flat rate charges for unlimited access to service **70**; and combinations of any of the foregoing. Other traffic plan criteria will now occur to those of skill in the art. Indeed, traffic plan criteria can be found in the Applicants' co-pending application number PCT/CA2007/001528 and entitled Policy Services, the contents of which are incorporated herein by reference.

While the foregoing describes certain specific embodiments, it is to be reemphasized that those embodiments are exemplary and can be modified and that variations, subsets and combinations of those embodiments are contemplated. Indeed, it is to be reemphasized that the specific examples of processing schemas and databases are simplified for ease of explanation. But it should be understood that the database format of Table I, and the database formats and schema formats of the other Tables can vary according to the specific computing environments used to implement each of the components in system **50**, and therefore configurator **122** can in turn be structured to accommodate such specific computing environments. As a still further example, the teachings of PCT/CA2007/001528 can be incorporated into the teachings herein.

Referring now to FIG. **3**, a communication system in accordance with another embodiment is indicated generally at **50***a*. System **50***a* is a variation on system **50** and therefore components in system **50***a* that have like components in system **50** bear the same reference character in both systems, except that in system **50***a* the reference character is followed by the suffix "a".

Of note is that system **50***a* includes a subscriber terminal **300***a* which connects to configurator **122***a* via a network **304***a*. In a present, purely exemplary, embodiment network **304***a* is the Internet. Subscriber terminal **300***a* is based on the functionality of desktop computing device that includes at least networking capabilities. Many well known desktop computing devices, or variants thereof, are suitable for the present embodiment. Referring now to FIG. **4**, a schematic block diagram of each subscriber terminal **300***a* is shown. It should be emphasized that the structure in FIG. **4** is purely exemplary, and contemplates a device that can be used for Internet communications over network **304***a*. Subscriber terminal **300***a* includes a plurality of input devices, which in a present embodiment includes a keyboard **400** and a microphone **404**. Other input devices, such as a microphone are also contemplated. Input from keyboard **400** and mouse **404** is received at a processor **408**, which in turn communicates with a non-volatile storage unit **442** (e.g. read only memory ("ROM"), Erase Electronic Programmable Read Only Memory ("EEPROM"), Flash Memory) and a volatile storage unit **446** (e.g. random access memory ("RAM")). Programming instructions that implement the functional teachings of subscriber terminal **300***a* as described herein are typically maintained, persistently, in non-volatile storage unit **442** and used by processor **408** which makes appropriate utilization of volatile storage **446** during the execution of such programming instructions. Variants on subscriber terminal **300***a* can include a laptop computer equipped with wireless capabilities. It will become apparent that even device **58***a* can serve the function as subscriber terminal **300***a*, thereby obviating the need for a separate subscriber terminal **300***a*.

Subscriber terminal **300***a* is configured to operate as a web-browser and therefore a web-browser application **436** is maintained in non-volatile storage **442** in order to permit subscriber S to operate subscriber terminal **300***a* and perform web-browsing functions. Also of note in system **50***a* is that configurator **122***a* is configured to operate a web-server to host web-browsing sessions on subscriber terminal **300***a*.

Referring now to FIG. **5**, a method for metering of telecommunication services is indicated in the form of a flowchart generally at **500**. Method **500** (or variants thereof) can be used, if desired, prior to invocation of method **200** (or a variation thereof), such that the traffic plan referenced at block **520** can be all or part of the traffic plan introduced at block **205**.

At block **505**, inputs are received representing metering levels. In a present exemplary embodiment, block **505** can be performed by the web-server executing on configurator **122***a* in conjunction with the web-browser application **436** executing on subscriber terminal **300***a*. In other words, a graphical user interface can be generated on subscriber terminal **300***a* which receives inputs from subscriber S that represent metering levels and which are in turn received at the web-server on configurator **122***a*.

FIG. **6** shows an example graphical user interface (GUI) **450** that can be hosted by configurator **122***a* for generation on display **420**. GUI **450**, via processor **408**, is responsive to inputs from keyboard **400** and mouse **404**. GUI **450** comprises a volume section, a quality of service section, an alert section and a pricing section.

The volume section outlines maximum amounts of data that can be downloaded to device **58***a* and uploaded from device **58***a* for various services. The volume selection is generally analogous in concept to Field 4 of Table I. In general, note that that the metering levels in FIG. **6** do not correspond exactly to the various levels that can form part of a tariff plan as discussed in relation to system **50**. This difference is intended illustrate that different types and configurations of tariff plans and the constituent elements thereof are contemplated. The volume section comprises a plurality of sliders **454-1**, **454-2**, **454-3**, **454-4**, **454-5**, **454-6**, **454-7** (collectively, sliders **454** and generically, slider **454**. This nomenclature is used elsewhere). Sliders are graphical representations of electro-mechanical rheostats. Each slider **454** is respective to a different service and can be used to select a different maximum amount of data that can be downloaded and/or uploaded in a given month. Slider **454-1** thus can be used to provide input representing maximum amount of data that can be downloaded and/or uploaded in a given month for a web-browsing service. Slider **454-2** thus can be used to provide input representing maximum amount of data (between zero and one Gigabyte) that can be downloaded and/or uploaded in a given month for a VoIP service that is hosted by carrier C. Slider **454-3** thus can be used to provide input representing maximum amount of data (between zero and two-hundred megabytes) that can be downloaded and/or uploaded in a given month for a VoIP service that is hosted by carriers other than carrier C. Slider **454-4** thus can be used to provide input representing maximum amount of data (between zero and five-hundred megabytes) that can be downloaded and/or uploaded in a given month for an IP Media Sharing service (e.g. Bittorrent or other peer to peer file sharing service). Slider **454-5** thus can be used to provide input representing maximum amount of data (between zero and one-hundred megabytes) that can be downloaded and/or uploaded in a given month for an Instant Messaging service hosted by carrier C (e.g. Bittorrent or other peer to peer file sharing service). Slider **454-6** thus can be used to provide input representing maximum amount of data (between zero and one-hundred megabytes) that can be downloaded and/or uploaded in a given month for an Instant Messaging service hosted by a carrier other than carrier C (e.g. Bittorrent or other peer to peer file sharing service). Slider **454-7** thus can be used to provide input representing maximum amount of data (between zero and fifty megabytes) that can be downloaded and/or uploaded in a given month for a gaming service (e.g. an online video game such as poker which is played via multiple devices like device **58** which are also connected to carrier C).

It should also be understood that the volume section, can, in other embodiments express different, or additional volume metrics, such as an event count (e.g. number of instant messages), minutes (e.g. maximum number of minutes of VoIP calling). Other volume metrics will now occur to those of skill in the art. Each slider **454** can also be configured to reflect a different volume metric.

Furthermore, as another variation, each slider **454** can be configured to show a representation of the exact amount of volume that is currently selected by that particular slider **454**. In this variation, each slider **454** would have a current value depicted in the slider which changes in real time as that slider **454** is slid up and down. The values within each slider **454** can be configured to be editable within the slider itself, so that one can simply enter the text, for example, "50 Mb" instead of having to accurately move it up and down to achieve 50 Mb.

GUI **450** can also be modified, for other embodiments, to have multiple screens, whereby "double-clicking" (or other selecting technique) on a particular slider **454** could invoke another GUI that provides granular detail about a particular service. For example, gaming slider **454-7** could be configured to be selectable so that another GUI is invoked (not shown in the Figures) on screen **420** with an additional set of sliders, and each of those sliders could be configured to reflect individual games, which in their aggregate would be capped by the volume selected according to slider **454-7** on GUI **450**. The quality of service section of GUI **450** comprises a plurality of switches **458**. Each switch **458** is respective to a slider **454** and the associated service. Switches **458** are, in a present example, graphical representations of 3-way electro-mechanical switches. Each switch **458** can be set to define a quality of service level for a particular service. In the present example, each switch **458** has three positions, labeled "B" for Bronze; "S" for Silver; and "G" for Gold. Bronze level of service would be the lowest quality of service level, while silver would be an intermediate quality of service level, and gold would be the highest quality of service level. Each quality of service level would generally reflect a maximum bit rate (generally analogous to Field 3 of Table I). Those skilled in the art will recognize that each switch **458** can be manifested via an alternative control (for example, a slider) that provides for a finer degree of granularity in terms of defining the quality of service level for a particular service.

The alert section of GUI **450** comprises a plurality of radio-boxes **459** that simply indicate "Y" for "Yes" or "N" for No. The radio-boxes, when set to "Y" indicate that a message is to be sent to device **58** when device **58** reaches (or nears) the maximum volume indicated in the maximum volume section. GUI **450** can be modified so that alert section also includes a volume metric that indicates the exact volume of consumption which will trigger the delivery of the alert to device **58**. The alert section could be modified to be an automatic quality of service adjustment. The identification of a volume metric in the alert section could thus be used (in lieu of or in addition to the actual alert notification) as part of generation of the tariff plan at block **520**, whereby a quality of service selection at switch **450** would be automatically dropped to the next lower setting once the selected volume in the alert section is reached, thereby deferring the reaching of the threshold value in exchange for a reduction in quality of service.

Note that GUI **450** can be implemented different combinations of sliders, switches or radio-boxes or other interactive graphics that can be used to provide the input contemplated at block **505** of method **500**.

At block **510**, a tariff plan representation is generated based on the inputs received at block **505**. In a present exemplary embodiment, block **510** is also performed by the web-server executing on configurator **122*a*** in conjunction with the web-browser application **436** executing on subscriber terminal **300*a***. In a present embodiment, the graphical user interface in FIG. **6** is also used as part of the implementation of block **510**, whereby a representation of the tariff plan is generated on subscriber terminal **300*a*** based on determinations made at configurator **122*a***.

Block **510** is implemented via the pricing section of GUI **450**, which comprises a pie-graph **462** that includes a dial-pointer **466** that indicates the total monthly price of a subscription that has a tariff plan that is implemented in accordance with the inputs provided in volume section, quality-of-service section and alert section. Also note, in the present exemplary embodiment, pie-graph **462** has two portions: a basic package portion **470** and an enhanced package portion **474**. Basic package portion **470** is filled with hatching, while enhanced package portion **474** is filled with cross-hatching. Such hatching and cross-hatching, it will be appreciated, can be effected with different colours rather than hatching and cross-hatching. Note that the hatching in basic package portion **470** corresponds to hatching on sliders **454-1**, **454-2** and **454-5**, while the cross-hatching in enhanced package portion **474** corresponds to cross-hatching on sliders **454-3**, **454-4**, **454-6** and **454-7**. Thus, pie-graph **462** indicates which portion of the tariff plan is attributable to basic services (i.e. those services associated with sliders **454-1**, **454-2** and **454-5**) and which portion of the tariff plan is attributable to enhanced services (i.e. those services associated with sliders **454-3**, **454-4**, **454-6** and **454-7**). It will be appreciated that what is designated "basic services" vs "enhanced services" can be determined by carrier C, and so designated in such a manner to encourage the use of "basic services" vs "enhanced services", or to make clear that additional charges are being levied for "enhanced services" due to the fact that they are more costly for carrier C to implement.

Note that while pie-graph **462** comprises two portions **470** and **474**, GUI **450** can be modified to have only one portion or to have more than one portion. For example, pie-graph **462** could be configured to have seven portions, with one portion being respective to each slider **454**. Furthermore, pie-graph **462** can be further segmented into further portions, with such additional portions configured to show which portion of the pie-graph **462** is attributable to a particularly quality of service respective to switches **458**.

Thus, in a typical scenario, the position of dial-pointer **466** will point to higher prices as any one or more of sliders **454** are raised. Likewise, the position of dial-pointer **466** will point to lower prices as any one or more of sliders **454** are lowered. Also, the position of dial-pointer **466** will point to higher prices as any one or more of switches **458** are increased from a lower quality of service level to a higher quality of service level. Likewise, the position of dial-pointer **466** will point to lower prices as any one or more any one or more of switches **458** are decreased to a lower quality of service level from a higher quality of service level. Pricing can also be changed according to whether or not any of the radio-boxes are selected.

Also of note, is that the size of basic package portion of **470** will increase or decrease according to changes to sliders **458-1**, **458-2** and **458-5** or switches **458-1**, **458-2**, and **458-5**, while the size of enhanced package portion of **474** will increase or decrease according to changes to sliders **454-3**, **454-4**, **454-6** and **454-7** or switches **458-3**, **458-4**, **458-6** and **458-7**.

In another variation, dial-pointer **466** can itself be configured to be selectable and movable, so that selecting and moving dial-pointer **466** towards a lower value can automatically cause corresponding sliders **454** and/or switches **458** to likewise lower. Conversely, moving dial-pointer **466** towards a higher value can automatically cause corresponding sliders **454** and/or switches **458** to likewise raise. As a still further variation, dial-pointer **466** can be configured so that individual sliders **458** and/or switches **458** can be "locked" in a given position, so that moving dial-pointer **466** will only cause corresponding movement in those sliders **458** and/or switches **458** which are not "locked". As a still further variation, dial-pointer **466** can be configured to be "locked", in addition to the ability to "lock" sliders **454** and/or switches **458**, so that movement of one unlocked slider **454** or switch **458** will only cause corresponding movement in those sliders **454** or switches **458** that are unlocked.

Referring again to FIG. **5**, at block **515** a determination is made as to whether the plan is accepted. In a present embodiment, and referring now to FIG. **6**, the determination of whether or not the plan is accepted is based on whether or not a selection button **478** is selected (via for example a selection and click of mouse **404**). If selection button **478** is not selected then method **500** cycles back to block **505**. If selection button **478** is selected then method **500** advances to block **520**.

At block **520**, a tariff plan is generated based on the inputs from block **505**. The resulting tariff plan can perform the input for block **205** of method **200**. At this point, however, it is to be reiterated that the specific services and associated options for the tariff plans that can be selected through the exemplary GUI **450** are not intended to be identical to the exemplary services and associated options for the tariff plans shown in Table I. In fact, each has different examples in order to illustrate the configurability associated with the teachings herein.

It should now be understood that method **500** need not be limited to system **50***a*, and that indeed method **500** and GUI **450** can be used to permit subscribers S to provide input representing desired home or business tariff plans for other types of data services, including home or business Internet access through wired services (e.g. T1, T3, Fibre-optic, Community Access TeleVision (CATV) coaxial links, Digital Subscriber Line (DSL)) or wireless services (WiMax, Universal Mobile Telecommunications Service, Enhanced Data Rates for GSM Evolution (EDGE)). Referring now to FIG. **7**, an example of another communication system that can be used with method **500** is indicated generally at **50***b*. System **50***b* is a variation on system **50***a* and therefore components in system **50***b* that have like components in system **50***a* bear the same reference character in both systems, except that in system **50***b* the reference character is followed by the suffix "b" instead of "a".

Of note is that system **50***b* is a much simplified version of system **50***a* and is based on a wired configuration. Link **66***b* is based on DSL, CATV, T1 or T3 (though it can be based on a wireless link). Carrier C operates any generic gateway equipment **54***b* (instead of GGSN **54***a* or GGSN **54**) that can connect link **66***b* to Internet **304***b*. Carrier C is an Internet Service Provider for subscriber station **300***b*. Subscriber station **300***b* can be used to access Internet **304***b*, but can also be used to access configurator **122***b* in order to perform method **500***b*. Configurator **122***b* is a simplified abstraction of configurator **122** in that configurator **122***b* is intended to generically cooperates with gateway equipment **54***b* to implement the tariff plan, and cooperating in a manner that is complementary to the functionality of gateway equipment **54***b*. Note that the billing functions of system **50***b* are omitted for simplified convenience, but that configurator **122***b* and gateway **54***b* likewise interact with such billing functions.

As a still further variation, GUI **450** can be modified to include radio-buttons, a drop-down box or other selection means that permits the selection of a number of pre-set tariff plans (not shown). Upon selection of one of the pre-set tariff plans, each slider **454**, switch **458**, radio-boxes **459**, pig-graph **462** and dial-pointer **466** will move to a predefined location on GUI **450**. In this modified embodiment, a tariff-plan with particular setting can be established with minimal input, or a predefined tariff plan can be tweaked to reflect unique preferences. As an example, a "basic" package and an "enhanced" package could be offered as pre-set plans. In this example, FIG. **6** could reflect the "enhanced" package, while selection of the "basic" package would cause: sliders **454-3**, **454-4**, **454-6** and **454-7** to drop to zero; dial-pointer **466** to point to the fifteen-pounds marker; and enhanced package portion **474** to disappear.

Still further variations are contemplated. FIG. **8** shows a method for metering of telecommunication services is indicated in the form of a flow-chart generally at **500***a*, which is a variation on method **500**. FIG. **9** shows another example graphical user interface GUI **450***a*, which is a variation on GUI **450**. GUI **450***a* is configured for use in conjunction with method **500***a*. Method **500***a* includes substantially the same blocks as method **500** and thus like blocks bear like references, except followed by the suffix "a". GUI **450***a* includes substantially the same components as GUI **450** and thus like components bear like references, except followed by the suffix "a". Of note is that method **500***a* includes two extra blocks: Block **507***a* is a decision block whereby a determination is made as to whether the tariff plan will allow sponsorships to subsidize the tariff plan; block **508***a* is arrived at from the "yes" branch of block **507***a*, whereby inputs are received relative to accepted sponsorship levels. To implement the functionality of block **507***a*, GUI **450***a* comprises a permit sponsorship selection button **480***a*. To implement functionality of block **508***a*, GUI **450***a* comprises a sponsorship section with a plurality of sponsorship level switches **481***a*, with each switch **481***a* respective to a slider **454***a*.

Permit sponsorship selection button **480***a* can be implemented in a toggle or on/off fashion, whereby if toggled "on" then switches **481***a* become interactive and if toggled "off" then switches **481***a* become non-interactive (perhaps disappearing altogether or becoming "greyed"). In a present embodiment, switches **481***a* have three settings: N which represents "no" sponsorship; "P" which represents "partial" sponsorship; and "F" which represents "full" sponsorship. No sponsorship means that no sponsorship is used to subsidize the service; partial sponsorship means that the service is partially subsidized, while full sponsorship means that the service is fully subsidized. A partially subsidized service could refer to, for example, in the context of VoIP, the playing of an audio advertisement prior to the connection of a voice call. As another example of a partially subsidized service, a video streaming service could be paused at periodic intervals for the playing of one or more video sponsorship messages. At the completion of the video sponsorship message(s), the video streaming service would resume. A fully subsidized service could refer to, for example, in the context of Gaming, the streaming of a banner across the screen **420** during entire playing of any particular game. Note in the example shown in FIG. **9**, that switches **481***a***-1**, **481***a***-2**, and **481***a***-5** are set to "N" for no sponsorship, while the remaining switches **481***a* are set to "P" for partial sponsorship. Note that since switches **481***a***-1**, **481***a***-2**, and **481***a***-5** are set to "N", and that those same switches **481***a***-1**, **481***a***-2**, and **481***a***-5** relate to basic package portion **470***a*, that basic package portion **470***a* is unchanged from basic package portion **470**. However, since switches **481***a***-3**, **481***a***-4**, **481***a***-6**, and **481***a***-7** are set to "P", and that those switches **481***a***-3**, **481***a***-4**, **481***a***-6** and **481***a***-7** relate to enhanced package portion **474***a*, that enhanced package portion **474***a* has been reduced in half in relation to enhanced package portion **474**. Those skilled in the art will recognize that switches **481***a* can be manifested via alternative controls (for example, sliders) that provide for a finer degree of granularity in terms of defining the level of sponsorship for a particular service.

It should be understood that the foregoing teachings can be combined with the teachings of Applicant's co-pending U.S. patent application Ser. No. 11/744,588 entitled "SYSTEM AND METHOD FOR PROVIDING CONTEXT BASED SERVICES" filed May 4, 2007.

Further variations, combinations and subsets of the foregoing embodiments will now occur to those skilled in the art.

The novel teachings herein can provide certain advantages. For example, where elements in system are produced by different vendors or have been deployed using separate specifications, configurator **122** can be deployed so as to automatically accommodate such differences to facilitate efficient deployments of different traffic plans. The teachings herein can satisfy this need.

All documents referenced are incorporated herein by reference.

The invention claimed is:

1. A communication system comprising:

at least one element for interconnecting a client device and a server for hosting a service; said element for implementing a traffic plan; said traffic plan for regulating access of said service by said client device;

a configurator connected to said element and to a subscriber terminal associated with said client device; said configurator adapted to:

receive inputs from said subscriber terminal representing a proposed version of said traffic plan;

generate a representation of said proposed version of said traffic plan, for display on said subscriber terminal;

continue receiving said inputs and generating said representation based on variations of said proposed version until an indication is received from said subscriber terminal that said traffic plan is accepted, and thereupon generate said traffic plan and automatically deploy said traffic plan amongst said at least one element.

2. The communication system of claim **1** wherein said at least one element includes one or more of a GPRS Gateway Service Node (GGSN), a Policy Charging Rules Function (PCRF), a Subscription Profile Repository (SPR) and an Online Charging Server (OCS).

3. The communication system of claim **1** wherein said at least one element include one or more of a Mobile Switching Center (MSC), Call Session Control Function (CSCF), Service Capability Interaction Manager (SCIM), Application Server (AS), Multimedia Messaging Service Center (MMS-C), Wireless Application Protocol (WAP) Gateway, Short Message Service Center (SMS-C), Unified Messaging Server, and content distribution servers.

4. The communication system of claim **2** wherein traffic plan includes said policy aspects that are respective to said PCRF and said SPR.

5. The communication system of claim **2** wherein said traffic plan includes charging aspects that are respective to said OCS.

6. The communication system of claim **1** wherein said service is one of software downloads, web-pages, instant messaging, email, web-mail, mapping services, location applications, social networking services and applications, file sharing services and applications, peer-to-peer services, music or video streams or downloads.

7. The communication system of claim **1** wherein said elements are configured to connect said client device to a plurality of different servers hosting different services and said traffic plan is for regulating access of each of said services by said client device.

8. The communication system of claim **7** wherein said services include at least one of software downloads, web-pages, instant messaging, email, web-mail, mapping services, location applications, social networking services and applications, file sharing services and applications, peer-to-peer services, music or video streams or downloads.

9. A configurator in accordance with claim **1**.

10. A method for configuring a communication system comprising:

at a configurator, receiving, from a subscriber terminal, inputs representing a proposed version of a traffic plan at a configurator, said traffic plan for regulating access of a service by a client device associated with said subscriber terminal;

at said configurator, generating a representation of said proposed version of said traffic plan based on said inputs, for display on said subscriber terminal;

at said configurator, repeating the receipt of inputs and the generation of said representation based on variations of said proposed version until an indication is received from said subscriber terminal that said traffic plan is accepted and thereupon, generating said traffic plan and automatically deploying said traffic plan from said configurator amongst at least one element adapted to interconnect said client device with a server hosting said service and to implement said traffic plan.

11. The method according to claim **10** wherein one of said traffic plan comprises policy aspects and a charging aspects.

12. The method according to claim **11** wherein said elements include one or more of a GPRS Gateway Service Node (GGSN), Service Capability Interaction Manager (SCIM), a Policy Charging Rules Function (PCRF), a Subscription Profile Repository (SPR) and an Online Charging System (OCS).

13. The method of claim **10** wherein said elements include one or more of a Mobile Switching Center (MSC), Call Session Control Function (CSCF), Application Server (AS), Multimedia Messaging Service Center (MMS-C), Wireless Application Protocol (WAP) Gateway, Short Message Service Center (SMS-C), Unified Messaging Server, and content distribution servers.

14. The method according to claim **12** wherein said policy aspects are respective to said PCRF and said SPR.

15. The method according to claim **12** wherein said charging aspects are respective to said OCS.

16. The method according to claim **10** wherein said service is one of software downloads, web-pages, instant messaging, email, web-mail, mapping services, location applications, social networking services and applications, file sharing services and applications, peer-to-peer services, music or video streams or downloads.

17. The method according to claim **10** wherein said elements are configured to connect said client device to a plurality of different servers hosting different services and said traffic plan is for regulating access of each of said services by said client device.

18. The method according to claim **17** wherein said services include at least one of software downloads, web-pages, instant messaging, email, web-mail, mapping services, location applications, social networking services and applications, file sharing services and applications, peer-to-peer services, music or video streams or downloads.

19. The method according to claim **10** wherein said inputs are received via a graphical user interface, said graphical user interface comprising input values respective to different types of services.

20. The method according to claim **19** wherein said representation is generated on said graphical user interface to indicate a total price for said proposed version of said traffic plan based on said inputs.

21. The method according to claim **19** wherein said inputs are provided using at least one of sliders, switches and radio boxes.

22. The method of claim **19** wherein said input values represent at least one of maximum volume and quality of service for each of said types of services.

23. The method of claim **19** wherein said maximum volume is respective to a given period of time.

24. The method of claim **19** wherein said different types of services include a first class of services and a second class of services.

25. The method of claim **24** wherein said first class of services is basic services and said second class of services is enhanced services.

26. The method of claim **24** wherein said representation is generated on said graphical user interface and indicates a total price for a traffic plan based on said inputs and further indicates which portion of said price is associated with said first class of services and which portion of said price is associated with said second class of services.

27. The method of claim **19** wherein said input values include a representation of whether to send an alert as to whether a maximum volume has been reached under said traffic plan.

28. The method according to claim **10** wherein said inputs include said at least one service.

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